## REMARKS

By the amendments presented, the Specification has been amended at Pages 33-37 to update the references to previously co-pending patent application numbers.

Further by the amendments presented, Claims 1-6 have been amended to correct the misspelling of the word "alkalizing".

Still further by the amendments presented, Claims 1 and 2 have been amended to clarify the pH valuation. Support for these amendments is found in Applicant's Specification at Page 11, lines 11-13.

Also by the amendments presented, Claim 1 has been amended to further characterize the acidifying agent. Support for this amendment is found in Applicant's Specification at Page 11, lines 11-13.

Also by the amendments presented, Claim 2 has been amended to depend from Claim 1.

Further by the amendments presented, Claims 5 and 8 were amended to delete reference to "preferably" clauses and to properly depend from Claim 2.

Attached hereto is a marked-up version of the changes made to the application by the current amendments. The attached page is captioned "Version with markings to show changes made."

Upon entry of the amendments presented, Claims 1-15 remain in the application. No new matter is added and no additional claims fee is believed to be due as a result of these amendments

## INVENTION SYNOPSIS

The present invention relates to multi-phase detergent tablets for use in a washing machine, the tablet comprising a first phase comprising alkalizing agent, and a second phase comprising acidifying agent, and wherein the alkalizing agent has an initial pH of at least 9 in a 1% aqueous solution or dispersion at 25°C and the acidifying agent has an initial pH of less than about 6.5 in a 1% aqueous solution or dispersion at 25°C, and wherein the tablet has a pH rate change index ($\Delta$pH) of no more than about 0.17 units/min.

The present invention also relates to methods for making such tablets.

**OBJECTIONS TO DISCLOSURE**

The disclosure has been objected to as being informal as to the citation of copending foreign applications on pages 33, last line; 34, last line; and 36, line 6. Namely, the applications "need to be updated."

In response, by the amendments herein, the application numbers have been replaced by their corresponding publication numbers. Applicants were unable to identify a reference in need of updating on Page 34, last line, but did find one on Page 35, last line, which was amended. If there is a reference that the Examiner still identifies as in need of updating, Applicants respectfully request that this reference number be named, as well as the page where it is found.

It is respectfully submitted that this objection has been overcome by the present amendments and should be withdrawn.

**OBJECTIONS TO CLAIMS**

Claims 1-6 have been objected to because of an informality in the misspelling of the word "alkalising." The Claims have been amended herein to properly spell "alkalizing." Therefore, it is respectfully submitted that this objection has been overcome and should be withdrawn.

**FORMALITY REJECTIONS UNDER 35 U.S.C. § 112**

a) Claims 1-3 and 5-15

Claims 1-3 and 5-15 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Office Action states that Claims 1 and 2 are indefinite in the recitation of a pH for the tablet. It is suggested that the wording on page 11, line 11-13 be incorporated into these claims. In response to the office action, Claims 1 and 2 have been amended to incorporate this wording. Therefore, it is respectfully submitted that Claims 1 and 2 are definite and this rejection should be withdrawn

The Office Action further states that Claim 5 lists preferably clauses and that Claims 5 and 8 lack support for the silicate references with respect to Claim 1. Claims 5 and 8 have been amended herein to remove the preferably clauses and to properly depend from Claim 2. It is therefore submitted that this rejection has been overcome and should be withdrawn.

**ART REJECTIONS**

**35 U.S.C. § 102**

a) 102(e) over Anderson

Claims 1 and 3 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Anderson (U.S. Patent No. 5,972,870). Applicants respectfully traverse this rejection as applied to the claims as amended herein.

Anderson relates to multi-layered laundry tablets that may contain a alkaline material in one layer and an acidic substance in another layer. Anderson fails to teach or suggest multi-layered laundry tablets that comprise an acidifying agent having an initial pH of less than about 6.5 in a 1% aqueous solution or dispersion at 25°C, and a tablet that has a pH rate change index (ΔpH) of no more than about 0.17 units/min.

The present invention relates to multi-phase detergent tablets for use in a washing machine, the tablet comprising a first phase comprising alkalising agent, and a second phase comprising acidifying agent, and wherein the alkalising agent has an initial pH of at least 9 in a 1% aqueous solution or dispersion at 25°C and the acidifying agent has an initial pH of less than about 6.5 in a 1% aqueous solution or dispersion at 25°C, and wherein the tablet has a pH rate change index (ΔpH) of no more than about 0.17 units/min.

Since Anderson does not teach or suggest the element of an acidifying agent with a pH of less than about 6.5, Anderson does not meet all of the elements of the presently claimed invention and as such, cannot be found to anticipate the claims under 35 U.S.C. § 102.

Furthermore, Anderson provides no motivation for one of ordinary skill to modify the tablets of Anderson to include these elements. Therefore, the claims of the present invention are not obvious in light of Anderson.

Given the foregoing considerations, it is submitted that Anderson does not teach each and every element of Applicant's claims, as amended herein. Furthermore, Applicants' Claims, as amended herein, are not rendered unpatentably obvious by the teachings of the Anderson reference. Accordingly, a rejection over Anderson under 35 U.S.C. § 102(e) is improper and should be withdrawn.

b) 35 U.S.C. § 102(a) alternatively 103(a)

c) 35 U.S.C. § 103(a)

Claims 1, 3, 6, 7, and 10 have been rejected under 35 U.S.C. 102(a) as anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Secemski, et al. (EP 0,851,024).

Claims 2, 4, 5, 8-9, and 11-15 have also been rejected under 35 U.S.C. § 103(a) as obvious in view of Secemski.

Applicant respectfully traverses these rejections as applied to the claims as amended herein. Because the claims now all depend from Claim1, these two rejections are discussed together herein.

Secemski relates to machine dishwashing tablets delivering a rinse aid benefit. Such tablets may have two layers, the first of which delivers a basic pH of 8.5 to 11 in the wash water and a second layer which delivers a neutral pH of 6.5 to 9 in the wash water. Importantly, Secemski does not teach or suggest a multi-layer tablet having a phase which delivers an acidic pH to the wash water of less than 6.5.

The present invention relates to multi-layered tablets for use in machine washing. The present invention, as now claimed, includes a phase which delivers an acidic pH to the wash water of less than 6.5. Secemski does not teach or suggest a multi-layer tablet having a phase or layer which delivers an acidic pH to the wash water of less than 6.5. In fact, the "acidifying" layer of Secemski is taught to return the wash water to a neutral pH. Therefore, Secemski fails to teach every element of the presently claimed invention and cannot therefore be found to anticipate the present claims. Furthermore, Secemski fails to provide any motivation to modify the Secemski tablets to include a phase which delivers an acidic pH to the wash water of less than 6.5. Since Secemski teaches to return the wash water to a neutral pH, one of ordinary skill would find no motivation to return the wash water to a more acidic

pH. Certainly, there is no suggestion in Secemski that such a modification would be useful or desirable.

Although the office action argues that it would have been obvious to modify Secemski to select a layered silicate, it is respectfully submitted that nowhere in Secemski is it suggested that a multi-layer tablet which comprises a first phase including or layer which delivers an acidic pH to the wash water of less than 6.5 in combination with the inclusion of the specific layered silicate according to the present invention.

Given the foregoing considerations, it is submitted that not only does Secemski fail to teach each and every element of Applicant's claims, as amended herein, but furthermore, Applicants' Claims, as amended herein, are not rendered unpatentably obvious by the teachings of the Secemski reference. Accordingly, a rejection of over Secemski under 35 U.S.C. § 102(a) or alternatively 103(a) is improper and should be withdrawn.

## CONCLUSION

Applicants have made an earnest effort to place their application in proper form and to distinguish their invention from the applied prior art. WHEREFORE, Applicants respectfully request the reconsideration of this application, withdrawal of the disclosure objections, withdrawal of the claim objections, withdrawal of the rejections under 35 U.S.C. § 112 second paragraph, 35 U.S.C. § 102(a) and (e) and 35 U.S.C. §103(a), and allowance of Claims 1-15.

Respectfully submitted,

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K:/AEM/Cases/CM1808/CM1808 Response to June 26 '02 OA.doc

**Customer Number: 27752**

**Version with markings to show changes made**

P&G Case CM1808

Serial No. 09/743,936

In the Specification

The Specification was amended as shown by hand-written notation on the attached specification page copies.

In the Claims

Claims 1-6 were amended to correct the spelling of "alkalising" to read "alkalizing." This annotation is show below for Claims 1, 2, and 5. This same annotation is applicable to Claims 3, 4 and 6, which are not shown.

1. A multi-phase detergent tablet for use in a washing machine, the tablet comprising a first phase comprising [alkalising] alkalizing agent, and a second phase comprising acidifying agent, and wherein the [multi-phase tablet] alkalizing agent has an initial pH of at least 9 in a 1% aqueous solution or dispersion at 25°C and the acidifying agent has an initial pH of less than about 6.5 in a 1% aqueous solution or dispersion at 25°C, and wherein the tablet has a pH rate change index (ΔpH) of no more than about 0.17 units/min.

2. A multi-phase detergent tablet according to Claim 1, wherein [for use in a washing machine,] the tablet [comprising] further comprises:

a) a [first phase comprising] silicate [alkalising] alkalizing agent including at least a crystalline layered sodium silicate of general formula I

$$NaMSi_xO_{2x+1} .yH2O \quad I$$

wherein M is sodium or hydrogen, x is a number from 1.9 to 22, and y is a number from 0 to 30 and

b) a second phase comprising a (bi)carbonate/acid disrupting agent. [,

and wherein the multi-phase tablet has an initial pH of at least 9[, preferably at least 9.5] in a 1% aqueous solution or dispersion at 25°C and a pH rate change index (ΔpH) of no more than about 0.17 units/min.]

5. A multi-phase detergent tablet according to [any of claims 1 to 4] Claim 2 wherein the silicate [alkalising] alkalizing agent comprises at least about 25%[, preferably at least about 50% and more preferably at least about 75%] by weight thereof of the crystalline layered sodium silicate of general formula I.

8. A multi-phase detergent tablet according to [Claims 1, 2, or 4] Claim 2 wherein the first phase is composed of a built active detergent composition comprising by weight thereof:
(1) from about 1% to about 12% of the crystalline layered sodium silicate of general formula I,
(2) from 0% to about 70% of a polyphosphate, zeolite, and/or polycarboxylate builders,
(3) from 0% to about 30% of carbonate and/or bicarbonate, and
(4) from 0% to about 10% of amorphous silicate.

Other suitable enzymes that can be included in the detergent compositions of the present invention include lipases. Suitable lipase enzymes for detergent usage include those produced by microorganisms of the Pseudomonas group, such as Pseudomonas stutzeri ATCC 19.154, as disclosed in GB-A-1,372,034. Suitable lipases include those which show a positive immunological cross-reaction with the antibody of the lipase, produced by the microorganism *Pseudomonas fluorescent* IAM 1057. This lipase is available from Amano Pharmaceutical Co. Ltd., Nagoya, Japan, under the trade name Lipase P "Amano," hereinafter referred to as "Amano-P". Other suitable commercial lipases include Amano-CES, lipases ex *Chromobacter viscosum*, e.g. *Chromobacter viscosum var. lipolyticum* NRRLB 3673 from Toyo Jozo Co., Tagata, Japan; *Chromobacter viscosum* lipases from U.S. Biochemical Corp., U.S.A. and Disoynth Co., The Netherlands, and lipases ex *Pseudomonas gladioli*. Especially suitable lipases are lipases such as M1 Lipase$^R$ and Lipomax$^R$ (Gist-Brocades) and Lipolase$^R$ and Lipolase Ultra$^R$(Novo) which have found to be very effective when used in combination with the compositions of the present invention. Also suitables are the lipolytic enzymes described in EP-A-0258068, WO-A-92/05249, WO-A-95/22615, WO-A-94/03578, WO-A-95/35381 and WO-A-96/00292.

Also suitable are cutinases [EC 3.1.1.50] which can be considered as a special kind of lipase, namely lipases which do not require interfacial activation. Addition of cutinases to detergent compositions have been described in e.g. WO-A-88/09367, WO-A-90/09446, WO-A-94/14963 and WO-A-94/14964.

The lipases and/or cutinases are normally incorporated in detergent composition at levels from 0.0001% to 2% of active enzyme by weight of composition.

Suitable proteases are the subtilisins which are obtained from particular strains of *B. subtilis* and *B. licheniformis* (subtilisin BPN and BPN'). One suitable protease is obtained from a strain of *Bacillus*, having maximum activity throughout the pH range of 8-12, developed and sold as ESPERASE® by Novo Industries A/S of Denmark, hereinafter "Novo". The preparation of this enzyme and analogous enzymes is described in GB 1,243,784 to Novo. Other suitable proteases include ALCALASE®, DURAZYM® and SAVINASE® from Novo and MAXATASE®, MAXACAL®, PROPERASE® and MAXAPEM® (protein engineered Maxacal) from Gist-Brocades. Proteolytic enzymes also encompass modified bacterial serine proteases, such as those described in European Patent ~~Application Serial Number 87 303761.8, filed April 28,~~ European Patent No. 0251446 B1, issued Dec. 28, 1994

~~1987 (particularly pages 17, 24 and 98),~~ and which is called herein "Protease B", and in EP-A-0199404 which refers to a modified bacterial serine protealytic enzyme which is called "Protease A" herein. Suitable is what is called herein "Protease C", which is a variant of an alkaline serine protease from *Bacillus* in which lysine replaced arginine at position 27, tyrosine replaced valine at position 104, serine replaced asparagine at position 123, and alanine replaced threonine at position 274. Protease C is described in WO-A-91/06637. Genetically modified variants, particularly of Protease C, are also included herein.

A suitable protease referred to as "Protease D" is a carbonyl hydrolase variant having an amino acid sequence not found in nature, which is derived from a precursor carbonyl hydrolase by substituting a different amino acid for a plurality of amino acid residues at a position in said carbonyl hydrolase equivalent to position +76, preferably also in combination with one or more amino acid residue positions equivalent to those selected from the group consisting of +99, +101, +103, +104, +107, +123, +27, +105, +109, +126, +128, +135, +156, +166, +195, +197, +204, +206, +210, +216, +217, +218, +222, +260, +265, and/or +274 according to the numbering of *Bacillus amyloliquefaciens* subtilisin, as described in WO-A-95/10591 and in the patent application of C. Ghosh, et al, "Bleaching Compositions Comprising Protease Enzymes" having US Serial No. 08/322,677, filed October 13, 1994.

Also suitable are proteases described in EP-A-0251 446 and WO-A-91/06637, protease BLAP® described in WO-A-91/02792 and their variants described in WO-A-95/23221.

See also a high pH protease from Bacillus sp. NCIMB 40338 described in WO-A-93/18140. Enzymatic detergents comprising protease, one or more other enzymes, and a reversible protease inhibitor are described in WO-A-92/03529. When desired, a protease having decreased adsorption and increased hydrolysis is available as described in WO-A-95/07791. A recombinant trypsin-like protease for detergents suitable herein is described in WO-A- 94/25583. Other suitable proteases are described in EP-A-0516 200.

Other suitable protease enzymes include protease enzymes which are a carbonyl hydrolase variant having an amino acid sequence not found in nature, which is derived by replacement of a plurality of amino acid residues of a precursor carbonyl hydrolase with different amino acids, wherein said plurality of amino acid residues replaced in the precursor enzyme correspond to position +210 in combination with one or more of the

following residues: +33, +62, +67, +76, +100, +101, +103, +104, +107, +128, +129, +130, +132, +135, +156, +158, +164, +166, +167, +170, +209, +215, +217, +218 and +222, where the numbered positions correspond to naturally-occurring subtilisin from Bacillus amyloliquefaciens or to equivalent amino acid residues in other carbonyl hydrolases or subtilisins (such as Bacillus lentus subtilisin). Preferred enzymes of this type include those having position changes +210, +76, +103, +104, +156, and +166.

The proteolytic enzymes are incorporated in detergent compositions at a level of from 0.0001% to 2%, preferably from 0.001% to 0.2%, more preferably from 0.005% to 0.1% pure enzyme by weight of composition.

Amylases (α and/or ß) can be included for removal of carbohydrate-based stains. WO-A-94/02597 describes cleaning compositions which incorporate mutant amylases. See also WO-A-95/10603. Other amylases known for use in cleaning compositions include both α - and β-amylases. α-Amylases are known in the art and include those disclosed in US-A-5,003,257; EP-A-0252,666; WO-A-91/00353; FR-A-2,676,456; EP-A-0285,123; EP-A-525,610; EP-A-0368,341; and GB-A-1,296,839. Other suitable amylases are stability-enhanced amylases described in WO-A-94/18314 and WO-A-96/05295 and amylase variants having additional modification in the immediate parent available from Novo Nordisk A/S, disclosed in WO-A-95/10603. Also suitable are amylases described in EP-A-0277216, WO-A-95/26397 and WO-A-96/23873.

Examples of commercial α-amylases products are Purafect Ox Am® from Genencor and Termamyl®, Ban® ,Fungamyl® and Duramyl®, Natalase ® all available from Novo Nordisk A/S Denmark. WO-A-95/26397 describes other suitable amylases : α-amylases characterised by having a specific activity at least 25% higher than the specific activity of Termamyl® at a temperature range of 25°C to 55°C and at a pH value in the range of 8 to 10, measured by the Phadebas® α-amylase activity assay. Suitable are variants of the above enzymes, described in WO-A-96/23873. Other amylolytic enzymes with improved properties with respect to the activity level and the combination of thermostability and a higher activity level are described in WO-A-95/35382.

Preferred amylase enzymes include those described in WO-A-95/26397 and in co-pending application by Novo Nordisk ~~PCT/DK96/00056~~ PCT Publication No. WO 9623873 A1, Published Aug. 8, 1996.

The amylolytic enzymes are incorporated in detergent compositions at a level of from 0.0001% to 2%, preferably from 0.00018% to 0.06%, more preferably from 0.00024% to 0.048% pure enzyme by weight of composition

In a particularly preferred embodiment, compositions herein comprise amylase enzymes, particularly those described in WO-A-95/26397 and co-pending application by Novo Nordisk PCT Publication No. WO 9623873 A1, Published Aug. 8, 1996 ~~PCT/DK96/00056~~ in combination with a complementary amylase.

By "complementary" it is meant the addition of one or more amylase suitable for detergency purposes. Examples of complementary amylases (α and/or ß) are described below. WO-A-94/02597 and WO-A-95/10603 describe cleaning compositions which incorporate mutant amylases. Other amylases known for use in cleaning compositions include both α- and β-amylases. α-Amylases are known in the art and include those disclosed in US-A-5,003,257; EP-A-0252,666; WO-A-91/00353; FR-A-2,676,456; EP-A-0 285123; EP-A-0525610; EP-A-0368341; and GB-A-1,296,839. Other suitable amylases are stability-enhanced amylases described in WO-A-94/18314 and WO-A-96/05295 and amylase variants having additional modification in the immediate parent available from Novo Nordisk A/S, disclosed in WO-A-95/10603. Also suitable are amylases described in EP-A-0277 216. Examples of commercial α-amylases products are Purafect Ox Am® from Genencor and Termamyl®, Ban® ,Fungamyl® and Duramyl®, all available from Novo Nordisk A/S Denmark. WO95/26397 describes other suitable amylases : α-amylases characterised by having a specific activity at least 25% higher than the specific activity of Termamyl® at a temperature range of 25°C to 55°C and at a pH value in the range of 8 to 10, measured by the Phadebas® α-amylase activity assay. Suitable are variants of the above enzymes, described in WO-A-96/23873. Other amylolytic enzymes with improved properties with respect to the activity level and the combination of thermostability and a higher activity level are described in WO-A-95/35382. Preferred complementary amylases for the present invention are the amylases sold under the tradename Purafect Ox Am$^R$ described in WO-A- 94/18314, WO-A-96/05295 sold by Genencor; Termamyl®, Fungamyl®, Ban® Natalase® and Duramyl®, all available from Novo Nordisk A/S and Maxamyl® by Gist-Brocades.

The complementary amylase is generally incorporated in detergent compositions at a level of from 0.0001% to 2%, preferably from 0.00018% to 0.06%, more preferably from 0.00024% to 0.048% pure enzyme by weight of composition. Preferably a weight of pure

enzyme ratio of specific amylase to the complementary amylase is comprised between 9:1 to 1:9, more preferably between 4:1 to 1:4, and most preferably between 2:1 and 1:2.

The above-mentioned enzymes may be of any suitable origin, such as vegetable, animal, bacterial, fungal and yeast origin. Origin can further be mesophilic or extremophilic (psychrophilic, psychrotrophic, thermophilic, barophilic, alkalophilic, acidophilic, halophilic, etc.). Purified or non-purified forms of these enzymes may be used. Also included by definition, are mutants of native enzymes. Mutants can be obtained e.g. by protein and/or genetic engineering, chemical and/or physical modifications of native enzymes. Common practice as well is the expression of the enzyme via host organisms in which the genetic material responsible for the production of the enzyme has been cloned.

Enzymes are normally incorporated in detergent composition at levels from 0.0001% to 2% of active enzyme by weight of composition. The enzymes can be added as separate single ingredients (prills, granulates, stabilized liquids, etc... containing one enzyme ) or as mixtures of two or more enzymes ( e.g. cogranulates ).

Other suitable detergent ingredients that can be added are enzyme oxidation scavengers which are described in copending European Patent ~~application 92870018.6 filed on January 31, 1992~~ No. 0553607 B1, issued March 18, 1998. Examples of such enzyme oxidation scavengers are ethoxylated tetraethylene polyamines.

A range of enzyme materials and means for their incorporation into synthetic detergent compositions is also disclosed in WO-A-9307263, WO-A-9307260, WO-A-8908694 and US-A-3,553,139. Enzymes are further disclosed in US-A-4,101,457 and US-A-4,507,219. Enzyme materials useful for liquid detergent formulations, and their incorporation into such formulations, are disclosed in US-A- 4,261,868. Enzymes for use in detergents can be stabilised by various techniques. Enzyme stabilisation techniques are disclosed and exemplified in US-A-3,600,319, EP-A-0199405 and EP-A-0200586. Enzyme stabilisation systems are also described, for example, in US-A-3,519,570. A useful Bacillus, sp. AC13 giving proteases, xylanases and cellulases, is described in WO-A-9401532.

Bleaching agent